

**UNITED STATES DEPARTMENT OF COMMERCE****Pat nt and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/144.607	08/31/98	CHESTER	A 10061-1

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RONALD A BLEEKER
MOBIL BUSINESS RESOURCES CORPORATION
3225 GALLOWS ROAD
FAIRFAX VA 22037

EXAMINER

PREISCH.N

ART UNIT

PAPER NUMBER

1764

DATE MAILED:

04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/144,607

Applicant(s)

CHESTER ET AL.

Examiner

Nadine Preisch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 28-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION***Election/Restrictions***

Applicants' arguments regarding the restriction requirement are untimely at this point because the restriction was made final in the office action of August 3, 1999. Any further arguments are required to be submitted in the form of a petition. However, in an effort to address some of applicants' arguments, the following response is provided.

Applicants' arguments asserting that the examiner is required to support agency action by substantial evidence of record in the proceedings is not persuasive to remove the restriction. It is maintained that the examiner has made a proper restriction because an alternative use for the claimed composition is provided and undue burden was shown as evidenced by a different classification for each invention. In response to questions regarding what constitutes a molecular sieve process, molecular sieve processes are known to include any processes which involve the use of molecular sieves including "hydrocracking", hydroisomerization, etc., which are mechanistically different from applicants' catalytic cracking process.

Furthermore, applicants are reminded that evidence in the form of a reference is not required to support a proposed alternate use. The MPEP specifically states "The burden is on the examiner to provide an example, but the example need not be documented". (MPEP 806.05 (h)) In this instance, an example of an alternate use has been provided and the applicants have not provided a reason why the alternative use as suggested by the examiner can not be accomplished.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 and 28-35 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's "non-lanthanide base metal" limitation is considered to be new matter because the specification does not provide any "recitation" of excluding such a component. An example that does not include such a limitation is not proper support for the conclusion that such lanthanide components are excluded from the entire disclosure.

Withdrawal of Claim Rejections - 35 U.S.C. § 102(b)

Applicants' arguments filed 12-15-00 are persuasive in overcoming the 102 (b) rejection of claims 1-7 and 10 over Collins et al.(5,482,617).

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7 and 10-14, 17-19 and 28-31 are rejected under 35 U.S.C. 103(a) as obvious over Collins et al.(5,482,617).

Applicants are claiming a process for reducing the sulfur content of a catalytically cracked gasoline. The processes involve catalytically cracking a petroleum feed containing organosulfur compounds in the presence of a cracking catalyst and a product sulfur reduction catalyst.

The reference of Collins et al.(5,482,617) discloses a desulfurization process for a catalytically cracked feedstream derived from an FCC process. See column 2, lines 38-55. The process comprises contacting a feed containing organic sulfur compounds with a fluidized catalyst at elevated temperatures in the range of 700-850°F. See column 2, lines 30-36 and column 4, lines 4-5. The reference further teaches that the catalyst is regenerated using standard commercial air supply and catalyst handling equipment and that the product stream can be fractionated with associated process equipment. See column 6, lines 50-65. A product that is derived from the process is a gasoline range material. See column 5, line 2. Collins et al.(5,482,617) also teaches that it is known that in heavier oils, sulfur is buried in the hydrocarbon and mild catalytic cracking is required to extract it. See column 2, lines 10-15.

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The reference teaches that the catalyst comprises a large pore molecular sieve in the form of a faujasite, a zeolite beta or a USY. See column 4, lines 35-38 and 62. The reference teaches that the catalyst may also comprise an intermediate pore size zeolite such as ZSM-5 or MCM-49. See column 4, lines 5-10. The reference further discloses that the molecular sieve component comprises a metal component such as a Group IB, IIB, IIIB, VA, VIA or VIIA metal. See column 5, lines 29-34. Collins et al.(5,482,617) discloses that zinc is a suitable metal. See column 5, line 42. The reference teaches a zeolite with a silica:alumina molar ratio in the range of 25:1 to 70:1. See column 5, lines 23-24. The particle size is in the range of 10-300 microns. See column 4, lines 55-58. The reference further teaches that the zeolite can be combined with a matrix material. See column 4, lines 20-22.

The reference of Collins et al.(5,482,617) succeeds in disclosing a process with steps corresponding to applicants' claimed catalyst contacting, regeneration and fractionation. Furthermore, the reference also succeeds in disclosing a catalyst with components corresponding to those claimed by applicants.

Several differences are noted between the reference of Collins et al.(5,482,617) and applicants' claimed invention. It is noted that the reference of Collins et al.(5,482,617) discloses the desulfurization of a lighter feed as opposed to the heavy oil feed claimed by applicants. In addition, the reference does not disclose the catalytic cracking of the feed. The reference is silent about the, the specific catalyst regeneration steps and the use of a "riser reactor" apparatus.

It would have been obvious to one of ordinary skill in the art at the time the invention was made desiring to desulfurize a heavy oil such as a vacuum gas oil to increase the severity of the reaction conditions of the Collins et al.(5,482,617) in order to accomplish mild cracking

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because Collins et al.(5,482,617) teaches that mild cracking is required to extract sulfur from heavier oils. Since it is known that heavier feeds require cracking, one of ordinary skill would be motivated to increase process conditions in order to remove sulfur from a heavier feed.

It would have been obvious to one of ordinary skill in the art practicing the Collins et al.(5,482,617) process to utilize any regeneration steps which would regenerate the catalyst, including applicants' regeneration steps in pending claim 11, because Collins et al.(5,482,617) does not limit the specific regeneration steps accomplished by the disclosed standard commercial air/ catalyst handling equipment. Applicants have not shown anything unexpected with respect to the specific regeneration steps. Such steps appear to be conventional in the art.

Furthermore, one of ordinary skill in the art modifying the Collins et al.(5,482,617) process to accomplish cracking would also modify the process to include a riser reactor and cracking regeneration apparatus because such apparatus is conventional for FCC cracking.

Claim Rejections - 35 U.S.C. § 103

Claims 8, 9, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al.(5,482,617) in view of Chu et al.(5,057,203).

See teachings of Collins et al.(5,482,617) above.

Several differences are noted between the reference of Collins et al.(5,482,617) and applicants' claimed invention. The reference is silent about the alpha value and unit cell size of the disclosed zeolites.

The reference of Chu et al.(5,057,203) is cited for the general teaching that it is known in the art that the alpha value of a composition is directly related to its cracking ability. See column 4, lines 4, lines 43-46. The reference discloses that a USY with a an alpha value of .1 to 1000

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and a unit cell size of 24.25-24.50 is suitable for hydrocarbon conversions such as cracking. See column 1, lines 10-12, column 7, lines 61-62 and column 8, lines 14-15.

Since the reference of Collins et al.(5,482,617) does not limit the alpha value of the disclosed compositions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a USY component with the alpha values and unit cell sizes disclosed by Chu et al.(5,057,203) because the reference of Chu et al.(5,057,203) discloses that a USY with such characteristics is suitable hydrocarbon conversions such as cracking.

Claim Rejections - 35 USC § 103

Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al.(5,482,617) in view of Kim (5,407,878).

See teachings of Collins et al.(5,482,617) above.

Several differences are noted between the reference of Collins et al.(5,482,617) and applicants' claimed invention. The reference does not disclose vanadium or iron components in the catalyst.

The reference of Kim (5,407,878) is cited to illustrate that iron and vanadium are known promoters for controlling SO_x emissions during oxidative regeneration processes. See abstract, lines 5-9 and column 1, lines 9-17.

Since the process of Collins et al.(5,482,617) involves oxidative regeneration, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a vanadium and/or iron component in the disclosed catalyst because the reference of Kim (5,407,878) illustrates that iron and/or vanadium is known to control SO_x emissions during oxidative regeneration.

Claim Rejections - 35 USC § 102(b)/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 10 and 29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Blanton, Jr. et al.(4,115,249).

The reference of Blanton, Jr. et al.(4,115,249) discloses an FCC process for treating heavy feedstocks such as heavy cycle oils which contain sulfur. See column 10, lines 14-15. The reference discloses examples of organic sulfur including thiophenes. See column 10, lines 19-20. The process involves contacting the feed with a catalyst comprising components in the form of a Y-type zeolite with an iron or vanadium promoter. See column 8, lines 16-25. The reference of Blanton, Jr. et al.(4,115,249) further discloses that the process is accomplished in an FCC riser. See column 12, line 24. The process also includes conventional oxidative regeneration steps. See column 10, lines 21-42.

The reference of Blanton, Jr. et al.(4,115,249) succeeds at disclosing a process which involves applicants' claimed cracking, catalyst, catalyst contacting, regenerating and riser apparatus .

It is noted that the reference is silent about a specific sulfur removal occurring. However, the removal of sulfur is considered to inherently occur because the reference discloses the removal of sulfur gases during the regeneration. The sulfur in such gases comes from the feed. In addition, it is noted that the Blanton, Jr. et al.(4,115,249) does not specifically refer to the catalyst as having sulfur reduction characteristics. . However, the disclosed compositions are

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considered to act in the capacity of product reduction catalysts because they would inherently accomplish the same conversion since they are contacted with the same feed under the same reaction conditions.

The reference of Blanton, Jr. et al.(4,115,249) anticipates applicants' sulfur removal process because it discloses essentially the same process steps.

Applicants' sulfur removal and product sulfur reduction catalyst property would have been obviously been provided as a result of operating the Blanton, Jr. et al.(4,115,249) process.

Claim Rejections - 35 USC § 103

Claims 11-13, 17, 19, 28, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanton, Jr. et al.(4,115,249).

See teachings of Blanton, Jr. et al.(4,115,249) above.

Several differences are noted between the reference of Blanton, Jr. et al.(4,115,249) and applicants' claimed invention. The reference is silent about treating applicants' specific vacuum gas oil. In addition, Blanton, Jr. et al.(4,115,249) is silent about the particle size of the disclosed catalyst.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat any heavy oil according to the Blanton, Jr. et al.(4,115,249) process including a vacuum gas oil because the process does not limit the specific heavy feeds treated. In the absence of unexpected results, it would appear that any heavy oil could be treated according to the Blanton, Jr. et al.(4,115,249) process.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to select any catalyst particle size that would accomplish the disclosed conversion, including the specific size claimed by applicants because it is within the level of ordinary skill to select a catalyst size in a known process. Applicants claimed size appears to be conventional and does not appear to produce any unexpected results.

Claim Rejections - 35 U.S.C. § 103

Claims 5, 8, 9, 14, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanton, Jr. et al.(4,115,249) in view of Chu et al.(5,057,203).

See teachings of Blanton, Jr. et al.(4,115,249) above.

Several differences are noted between the reference of Blanton, Jr. et al.(4,115,249) and applicants' claimed invention. The reference is silent about a specific USY zeolite. In addition, the Blanton, Jr. et al.(4,115,249) is silent about the alpha value and unit cell size of the disclosed zeolites.

The reference of Chu et al.(5,057,203) is cited for the general teaching that it is known in the art that the alpha value of a composition is directly related to its cracking ability. See column 4, lines 4, lines 43-46. The reference discloses that a USY with a an alpha value of .1 to 1000 and a unit cell size of 24.25-24.50 is suitable for hydrocarbon conversions such as cracking. See column 1, lines 10-12, column 7, lines 61-62 and column 8, lines 14-15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select a USY as the Y-type zeolite in Blanton, Jr. et al.(4,115,249) because the reference of Chu et al.(5,057,203) illustrates that USY zeolites are desirable cracking catalysts.

Since the reference of Blanton, Jr. et al.(4,115,249) does not limit the alpha value of the disclosed compositions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a USY component with the alpha values and unit cell sizes

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disclosed by Chu et al.(5,057,203) because the reference of Chu et al.(5,057,203) discloses that a USY with such characteristics is suitable hydrocarbon conversions such as cracking.

Response to Arguments

Applicants' arguments with respect to the distinction in the light feed of Collins et al.(5,482,617) and applicants' heavy oil are persuasive. The modified rejection above addresses the distinction.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-5408 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.P.
April 21, 2001

NP

NADINE PREISCH
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